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EXAMINER	
HON, SOW FUN	
ART UNIT	**PAPER NUMBER**
1772	

DATE MAILED: 08/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/631,152	ELMAN ET AL.
	Examiner	Art Unit
	Sow-Fun Hon	1772

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) *32* is/are withdrawn from consideration.

5)☒ Claim(s) *20 and 21* is/are allowed.

6)☒ Claim(s) *1-19,22-31 and 34* is/are rejected.

7)☒ Claim(s) *33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Withdrawn Rejections

1. The obviousness-type double patenting rejection over copending application 10/431,742 is withdrawn due to the terminal disclaimer dated 06/10/05.

2. The 35 U.S.C. 103(a) rejections are withdrawn due to Applicant's amendment dated 06/10/05.

New Rejections

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation of "one or more B layers contain an amorphous polymer and have an out-of-plane birefringence more negative than –0.01" is already present in parent claim 1.

Claim Rejections – 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-19, 22-26, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezzell et al. (US 5,750,641).

Regarding claims 1-2, 34, Ezzell teaches a multilayer compensator (angularity enhancement construction) comprising layer A of Applicant, which is an optically transparent and optically isotropic[1] first layer (substrate) comprising polymeric material (column 2, lines 35-40). Ezzell teaches that the layer comprising polymeric material has zero birefringence[1] in all directions, including out-of-plane (optically isotropic[1]), which is within the claimed out-of-plane birefringence range of not more negative than –0.01.

[1] *Merriam-Webster's Collegiate Dictionary, 10th edition, defines the term "isotropic" as exhibiting properties with the same values when measured along axes in all directions, and "birefringence" as the refraction of light in an anisotropic material, wherein the term "anisotropic" is defined as exhibiting properties with different values when measured in different directions.*

The substrate of Ezzell, which meets the requirements of layer A of Applicant, has at least one contiguous second layer (on at least one surface thereof) of polyimide having an out-of-plane birefringence in the range of –0.001 to –0.2 (column 3, lines 30-40), which overlaps the claimed range of more negative than –0.01. Polyimide is inherently an amorphous polymeric material as defined by Applicant's specification (page 5, lines 20-30). Hence the contiguous second layer of amorphous polyimide

meets the requirements of layer B of Applicant. Ezzell teaches that the multilayer compensator (angularity enhancement layers) has an off-normal retardation of at least about 50 nm (column 5, lines 50-60), provided by the second polyimide layer, the underlying first layer being optically isotropic (column 2, lines 35-40).

Ezzell teaches that it is understood that retardation values are actually negative numbers although we refer to values for retardation in absolute numbers (column 5, lines 50-60). Therefore although Ezzell fails to specify the combination of an overall in-plane retardation (R_{in}) of the multilayer compensator of greater than 20 nm and an overall out-of-plane retardation (R_{th}) of the multilayer compensator of greater than – 20 nm, because Ezzell teaches that the multilayer compensator (angularity enhancement layers) has an off-normal retardation of at least about 50 nm, and that it is understood that retardation values are actually negative numbers although we refer to values for retardation in absolute numbers, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided for a combination of an overall in-plane retardation (R_{in}) of the multilayer compensator of greater than 20 nm and an overall out-of-plane retardation (R_{th}) of the multilayer compensator of greater than – 20 nm, in order to obtain the desired overall retardation of the multilayer compensator.

Ezzell teaches that optional retarder layers which include biaxially-oriented films 34 and 35 may be provided with polymeric B layer (angularity enhancement layer 38, column 11, lines 20-35). Therefore the multilayer compensator of Ezzell is biaxial in this embodiment due to the biaxially-oriented retarder layers.

Regarding claim 3, Ezzell teaches that there is one second layer of polyimide, B layer, in the multilayer compensator disposed on at least one surface of the optically isotropic first layer, A layer, (substrate) (column 2, lines 35-40), meaning that the other surface of the first layer A can have another second layer B of polyimide. In this case, all of A layers and B layers are contiguous.

Regarding claims 4-6, Ezzell et al. teaches that each layer B (polyimide second layer) can have a thickness of from about 1 to about 25 micrometers (column 10, lines 40-50) and when combined can have a total thickness of from about 2 to about 20 micrometers (column 10, lines 40-50) which overlaps the claimed range of less than 30 micrometers (claim 4), of from 0.1 to 10 micrometers (claim 5), of from 1.0 to 10 micrometers (claim 8) and of from 2 to 8 micrometers (claim 6).

Regarding claims 7-10, Ezzell teaches that the multilayer compensator (angularity enhancement layers) has an off-normal retardation of at least about 50 nm (column 5, lines 50-60), provided by the second polyimide layer B, the underlying first layer A being optically isotropic (column 2, lines 35-40). Therefore although Ezzell fails to specify the combination of an overall in-plane retardation (R_{in}) of the multilayer compensator of greater than 20 nm and an overall out-of-plane retardation (R_{th}) of the multilayer compensator of greater than – 20 nm, because Ezzell teaches that the multilayer compensator (angularity enhancement layers) has an off-normal retardation of at least about 50 nm, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided for isotropic combined layers A, such that a combination of an overall in-plane retardation (R_{in}) of the multilayer compensator

of greater than 20 nm (claim 7), of between 30 and 200 nm (claim 8), of between 30 and 150 nm (claim 9), and of between 30 and 100 nm (claim 10), is provided by the combined layers B of polyimide, in order to obtain the desired overall retardation of the multilayer compensator.

Regarding claims 11-13, Ezzell teaches that the isotropic first layer A of the compensator can have a thickness of from about 25 to about 100 micrometers (column 10, lines 35-40) while each polyimide second layer B can have a thickness of from about 1 to about 25 micrometers (column 10, lines 40-50). Therefore the thickness of the combined first A and second B layers of the compensator (lower range end total of 2 + 25 =27 micrometers and upper range end total of 20 + 100 = 120 micrometers) overlaps the claimed range of less than 200 micrometers (claim 11), from 40 to 150 micrometers (claim 12) and from 80 to 110 micrometers (claim 13).

Regarding claims 14-16, Ezzell teaches that the multilayer compensator (angularity enhancement layers) has an off-normal retardation of at least about -50 nm (column 5, lines 50-60), provided by the second polyimide layer B (column 2, lines 35-40). Therefore although Ezzell fails to specify that the combined R_{th} (out-of-plane retardation) of the B layers is –20 nm or more negative, because Ezzell teaches that the off-normal retardation of the multilayer compensator, provided by the second polyimide layer B, is at least about –50 nm, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a combined R_{th} of the B layers within the claimed ranges of more negative than -20 nm (claim 14), from –60 to –

600 nm (claim 15) and from –50 to –500 nm (claim 16), in order to obtain the desired retardation for the desired end-use of the multilayer compensator.

Regarding claims 17-18, Ezzell teaches that the Tg of the second layer B of polyimide is 367 °C in Example 2 (column 14, lines 10-15), which is above 180 °C (claim 17). One embodiment is a polyimide layer B coated on a stretched biaxially oriented polymer film, which is layer A of Applicant (column 8, lines 40-45). In order to preserve the stretched biaxially oriented state of layer A, the Tg of the polymer in layer A is preferably at least at the Tg of the second layer B, which is 367 °C (column 14, lines 10-15), which is above 180 °C. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have formed layer A with a polymer wherein the Tg is above 180 °C, in order to preserve the stretched biaxially oriented state of layer A during coating of polyimide layer B onto layer A.

Regarding claim 19, Table 1 of Ezzell (columns 13-14, lines 20-60) shows that the backbone of the polyimide contains carbonyl, imide and aromatic (phenyl) groups. These groups are non-visible chromophore groups as defined by Applicant's specification (page 8, lines 10-15).

Regarding claim 22, Ezzell teaches that the first layer A (substrate) can be a triacetyl cellulose (cellulose triacetate) (column 10, lines 30-40), which is provided as a polymer of first layer A provided by Applicant in the specification (page 6, lines 25-30), other than a polymer containing in the backbone a non-visible chromophore group having a Tg above 180 °C.

Regarding claim 23, although Ezzell fails to teach that the second layer polyimide B of the multilayer comprises a polymer containing in the backbone a non-visible chromophore group that does not contain a chromophore off of the backbone, Ezzell teaches that prior art negatively birefringent polyimide films have been made from benzene dianhydrides and monoaromatic diamines (column 1, lines 25-35). Polyimides made from benzene dianhydrides and monoaromatic diamines contain in the backbone the rigid phenyl (benzene) group, which is a non-visible chromophore group as defined by Applicant's specification (page 8, lines 10-15), and no chromophore groups, as defined by Applicant, off the backbone of the polymer. Therefore, because Ezzell teaches that prior art negatively birefringent polyimide films have been made from benzene dianhydrides and monoaromatic diamines, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a polyimide containing in the backbone a non-visible chromophore group that does not contain a chromophore off of the backbone, in place of the polyimide of Ezzell, in order to obtain an alternate multilayer compensator with the desired optical properties.

Regarding claims 24, 26, Ezzell teaches that the optically isotropic first layer A (substrate) comprises triacetyl cellulose (cellulose triacetate) (column 10, lines 30-40) (claims 24, 26).

Regarding claim 25, Ezzell teaches that first layer A (substrate) can also be a stretched biaxially oriented polymer film such as polycarbonate (column 8, lines 40-45). Polycarbonate is an inherently amorphous polymeric material as defined by Applicant's specification (page 5, lines 20-30). The stretching of a polymer is preferably conducted

above its glass transition temperature in order to allow the polymer chains to flow and hence uniformly orient when stretched. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have stretched the polymer film above its glass transition temperature, in order to obtain uniform orientation of the film.

7. Claims 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezzell as applied to claims 1-6, 11-17, 19, 22-26 above, and further in view of Terashita (US 6,512,561).

Ezzell teaches a multilayer compensator comprising one or more polymeric layer A layers and one of more polymeric B layers, wherein said A layers comprise a polymer having an out-of-plane birefringence not more negative than –0.01; said B layers comprise an amorphous polymer having an out-of-plane birefringence more negative than –0.01; and the compensator is biaxial, wherein the overall in-plane retardation of said multilayer compensator is greater than 20 nm and the out-of-plane retardation of said multilayer compensator is more negative than –20 nm, as described above. In addition, Ezzell teaches that the multilayer compensator is used in a liquid crystal display (column 11, lines 35-45) wherein a pair of polarizers are located one on each side of the liquid crystal cell (column 11, lines 25-35), but fails to teach that the polarizers are crossed.

Terashita has a multilayer (plurality of laminated films) compensator (column 10, lines 40-45) whereby one or more first layers (supporting substrate) is coated with one or more second layers having birefringence (index anisotropy) in order to obtain a

negative retardation which is out-of-plane (in a direction normal to the substrate) (column 10, lines 40-50). The first and second layers A, B, are therefore contiguous, and the first layer A (supporting substrate) has no birefringence, or an out-of-plane birefringence of 0, which is within the claimed range of not more negative than –0.005. Terashita is therefore analogous art.

Regarding claim 27, Terashita teaches that the multilayer compensator is used in a liquid crystal display, with a pair of polarizers, one on each side of (sandwiches) the liquid crystal cell (abstract). The polarizers are crossed (column 3, lines 15-20) in a crossed-Nichols arrangement. Terashita demonstrates that a crossed pair of polarizers, one on each side of the liquid crystal cell is well known in the art at the time the invention was made. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have crossed the pair of polarizers on both sides of the liquid crystal cell of Ezzell, in order to obtain the desired polarized optics for the liquid crystal display of Ezzell.

Regarding claim 28, Ezzell teaches a twisted nematic liquid crystal cell (column 11, lines 30-35).

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ezzell in view of Terashita as applied to claims 27-28 above, and further in view of Matsuoka et al. (US 6,630,973).

Ezzell in view of Terashita teaches a liquid crystal display comprising a liquid crystal display cell, a pair of crossed polarizers located one on each side of the cell, and at least one multilayer compensator comprising one or more polymeric layer A layers

and one of more polymeric B layers, wherein said A layers comprise a polymer having an out-of-plane birefringence not more negative than –0.01; said B layers comprise an amorphous polymer having an out-of-plane birefringence more negative than –0.01; and the compensator is biaxial, wherein the overall in-plane retardation of said multilayer compensator is greater than 20 nm and the out-of-plane retardation of said multilayer compensator is more negative than –20 nm, as described above. In addition, Ezzell teaches a liquid crystal display which employs a twisted nematic liquid crystal cell (column 1, lines 30-35), but fails to teach an optically compensated bend liquid crystal cell.

Matsuoka teaches that liquid crystal cell types include twisted nematic, vertically aligned, and optically compensatory bend, which are equivalent in terms of providing for the transmission type of liquid crystal display (column 1, lines 20-35).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have employed an optically compensated bend liquid crystal cell in place of the twisted nematic liquid crystal cell in the liquid crystal display of Ezzell in view of Terashita, as taught by Matsuoka, in order to obtain a transmission liquid crystal display with the desired optical compensation.

9. Claims 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezzell as applied to claims 1-19, 22-26 above, and further in view of Matsuoka et al. (US 6,630,973).

Ezzell teaches a liquid crystal display comprising a liquid crystal cell, at least one polarizer, and a multilayer compensator comprising one or more polymeric layer A

layers and one of more polymeric B layers, wherein said A layers comprise a polymer having an out-of-plane birefringence not more negative than –0.01; said B layers comprise an amorphous polymer having an out-of-plane birefringence more negative than –0.01; and the compensator is biaxial, wherein the overall in-plane retardation of said multilayer compensator is greater than 20 nm and the out-of-plane retardation of said multilayer compensator is more negative than –20 nm, as described above.

Regarding claim 30, Ezzell fails to teach a reflective plate.

Matsuoka teaches that a liquid crystal display of reflection type comprises a polarizer (polarizing element), a reflective plate (reflection board), and a compensator (optical compensatory sheet) (column 1, lines 15-25). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have placed a reflective plate in the liquid crystal display of Ezzell, in order to obtain a reflection-type liquid crystal display, as taught by Matsuoka.

Regarding claim 31, Ezzell teaches a twisted nematic liquid crystal cell, but fails to teach that it is also vertically aligned.

Matsuoka teaches that examples of reflection type liquid crystal display cells (modes) include twisted nematic (TN), and hybrid aligned cells, which comprise vertically aligned twisted nematic cells (column 1, lines 28-35). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a vertically aligned twisted nematic cell in place of the twisted nematic cell of Ezzell, in order to obtain a hybrid aligned reflection type liquid crystal display, as taught by Matsuoka.

Allowable Subject Matter

10. Claim 33 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The cited prior art of record, US 5,720,641 fails to teach, even with US 6,628,359 and US 6,630,973, the combination of a multilayer compensator comprising one or more polymeric A layers and one or more polymeric B layers, wherein: said A layers comprise a polymer having an out-of-plane birefringence not more negative than -0.01, and one or more of said A layers have an in-plane retardation greater than +20 nm, said B layers comprise an amorphous polymer having an out-of-plane birefringence more negative than –0.01; and the overall in-plane retardation (Re) of the multilayer compensator is greater than +20nm and the out-of-plane retardation (Rth) of said multilayer compensator is more negative than -20nm, None of the references teach that the polymeric A layer has an in-plane retardation of greater than +20 nm.

11. Claims 20-21 are allowed. The cited prior art of record, US 5,720,641 fails to teach, even with US 6,628,359, the combination of a multilayer compensator comprising one or more polymeric A layers and one or more polymeric B layers, wherein: said A layers comprise a polymer having an out-of-plane birefringence not more negative than -0.01, said B layers comprise an amorphous polymer having an out-of-plane birefringence more negative than –0.01; and the overall in-plane retardation (Re) of the multilayer compensator is greater than +20nm and the out-of-plane retardation (Rth) of

said multilayer compensator is more negative than -20nm, wherein a B layer comprises a copolymer containing 1) a poly(4,4'-hexafluoroisopropylidene-bisphenol) terephthalate-co-isophthalate, 2) a poly(4,4'-hexahydro-4,7-methanoindan-5-ylidene bisphenol) terephthalate, 3) a poly(4,4'-isopropylidene-2,2',6,6'-tetrachlorobisphenol) terephthalate-co-isophthalate, 4) a poly(4,4'-hexafluoroisopropylidene)-bisphenol-co-(2-norbornylidene)-bisphenol terephthalate, 5) a poly(4,4'-hexahydro-4,7-methanoindan-5-ylidene)-bisphenol-co-(4,4'-isopropylidene-2,2',6,6'-tetrabromo)-bisphenol terephthalate, and 6) a poly(4,4'-isopropylidene-bisphenol-co- 4,4'-(2-norbornylidene) bisphenol) terephthalate-co-isophthalate or 7) a poly(4,4'-hexafluoroisopropylidene-bisphenol-co-4,4'-(2-norbornylidene) bisphenol) terephthalate-co-isophthalate. None of the references teach the claimed materials of said B layer.

Response to Arguments

12. Applicant's arguments with respect to claims 1-19, 22-31 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon.
Sow-Fun Hon
08/09/05

HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772
8/15/05